WHAT IS CLAIMED IS:

1. A catalytic trap disposed in an exhaust passage of an internal combustion engine which is operated with periodic alternations between lean and stoichiometric or rich conditions, for abatement of NO_x in an exhaust gas stream which is generated by the engine, comprising:

(A) a catalytic trap material comprising:

(i) a refractory metal oxide support;

(ii) a catalytic component effective for promoting the reduction of NO_x under stoichiometric or rich conditions; and

(iii) a NO_x sorbent effective for adsorbing the NO_x under lean conditions and desorbing and reducing the NO_x to nitrogen under stoichiometric or rich conditions, comprising:

(a) a metal oxide selected from the group consisting of alkali metal oxides, alkaline earth metal oxides and mixtures of one or more alkali metal oxides and alkaline earth metal oxides; and

(b) a manganese component selected from the group consisting of: (1) a manganese oxide, (2) a mixed oxide of manganese and a transition metal and/or a rare earth metal, (3) a compound of an alkali metal and a manganese oxide, (4) a compound of an alkaline earth metal and a manganese oxide and (5) mixtures of the foregoing oxides and compounds; and

(B) a refractory carrier member on which the catalytic trap material is disposed.

2. The trap of claim 1 wherein the support is selected from the group consisting of alumina, titania, titania-alumina, zirconia, zirconia-alumina, baria-alumina and titania-zirconia.

3. The trap of claim 2 wherein the support comprises gamma-alumina.

4. The trap of claim 1 wherein the support is present in an amount of about 1.5 to about 5.0 g/in^3.

5. The trap of claim 4 wherein the support is present in an amount of 2 to 4 g/in^3.

6. The trap of claim 1 wherein the catalytic component comprises a precious metal component.

7. The trap of claim 6 wherein the precious metal component is selected from the group consisting of platinum, palladium, rhodium components and mixtures thereof.

8. The trap of claim 7 wherein the precious metal component comprises platinum which is present in an amount of at least about 20% by weight of the total amount of precious metal components.

9. The trap of claim 1 wherein the catalytic component is present in an amount of about 20 to about 200 g/ft^3.

10. The trap of claim 9 wherein the catalytic component is present in the amount of 50 to 150 g/ft^3.

11. The trap of claim 1 wherein the alkali metal oxide is selected from the group consisting of oxides of potassium, sodium, lithium, cesium and mixtures thereof.

12. The trap of claim 1 wherein component (a) of the NO_x sorbent comprises potassium oxide.

13. The trap of claim 1 wherein the alkali metal oxide, if present, is present in an amount of about 0.05 to about 0.75 g/in^3.

14. The trap of claim 13 wherein the alkali metal oxide, if present, is present in an amount of 0.1 to 0.5 g/in^3.

15. The trap of claim 1 wherein the alkaline earth metal oxide is selected from the group consisting of oxides of barium, magnesium, calcium, strontium, zinc and mixtures thereof.

16. The trap of claim 15 wherein the alkaline earth metal oxide comprises barium oxide.

17. The trap of claim 1 wherein the alkaline earth metal oxide, if present, is present in an amount of about 0.1 to about 3 g/in^3.

18. The trap of claim 17 wherein the alkaline earth metal oxide, if present, is present in an amount of 0.5 to 2.5 g/in^3.

19. The trap of claim 1 wherein the manganese component is present in an amount of about 0.05 to about 0.5 g/in^3.

20. The trap of claim 19 wherein the manganese component is present in the amount of 0.1 to 0.3 g/in^3.

21. The trap of claim 1 wherein the manganese component comprises a manganese oxide is selected from the group consisting of MnO, Mn_3O_4, Mn_2O_3, MnO_2 and Mn_2O_7.

22. The trap of claim 1 wherein the manganese component comprises a mixed oxide of manganese and a transition metal and/or a rare earth metal, said transition metal being selected from the group consisting of zirconium, titanium and tin, and said rare earth metal being selected from the group consisting of lanthanum, neodymium, niobium and praseodymium.

23. The trap of claim 1 wherein the manganese component comprises a compound of an alkali metal and a manganese oxide, said alkali metal being selected from the group consisting of potassium, sodium, lithium and cesium.

24. The trap of claim 1 wherein the manganese component comprises a compound of an alkaline earth metal and a manganese oxide, said alkaline earth metal being selected from the group consisting of barium, magnesium, calcium, strontium, and zinc.

25. The trap of claim 1 wherein the carrier member is selected from the group consisting of stainless steel, titanium, Fecralloy, aluminum zirconate, aluminum titanate, aluminum phosphate, cordierite, mullite and corundum.

26. The trap of claim 1 further comprising a catalytic device comprising a three-way conversion catalyst disposed upstream of the trap.

27. The trap of claim 1 further comprising a catalytic device comprising a three-way conversion catalyst disposed downstream of the trap.

28. A process for abatement of NO_x in an exhaust gas stream which is generated by an internal combustion engine which is operated with periodic alternations between lean and stoichiometric or rich conditions, comprising locating a catalytic trap in an exhaust passage of the engine and treating the exhaust gas stream with a catalytic trap whereby at least some of the NO_x in the exhaust gas stream is adsorbed by the catalytic trap during the periods of lean conditions and is desorbed from the catalytic trap and reduced to nitrogen during the periods of stoichiometric or rich conditions, said catalytic trap comprising:

(A) a catalytic trap material, comprising:

(i) a refractory metal oxide support;

(ii) a catalytic component effective for promoting the reduction of NO_x under stoichiometric or rich conditions; and

(iii) a NO_x sorbent effective for adsorbing the NO_x under lean conditions and desorbing and reducing the NO_x to nitrogen under stoichiometric or rich conditions, comprising:

(a) a metal oxide selected from the group consisting of alkali metal oxides, alkaline earth metal oxides and mixtures of one or more alkali metal oxides and alkaline earth metal oxides; and

(b) a manganese component selected from the group consisting of: (1) a manganese oxide, (2) a mixed oxide of manganese and a transition metal and/or a rare earth metal, (3) a compound of an alkali metal and a manganese oxide, (4) a compound of an alkaline earth metal and a manganese oxide and (5) mixtures of the foregoing oxides and compounds; and

(B) a refractory carrier member on which the catalytic trap material is disposed.

29. The process of claim 28 wherein the support is selected from the group consisting of alumina, titania, titania-alumina, zirconia, zirconia-alumina, baria-alumina and titania-zirconia.

30. The process of claim 29 wherein the support comprises gamma-alumina.

31. The process of claim 28 wherein the support is present in an amount of about 1.5 to about 5.0 g/in^3.

32. The process of claim 31 wherein the support is present in an amount of 2 to 4 g/in^3.

33. The process of claim 28 wherein the catalytic component comprises a precious metal component.

34. The process of claim 33 wherein the precious metal component is selected from the group consisting of platinum, palladium, rhodium components and mixtures thereof.

35. The process of claim 34 wherein the precious metal component comprises platinum which is present in an amount of at least about 20% by weight of the total amount of precious metal components.

36. The process of claim 28 wherein the catalytic component is present in an amount of about 20 to about 200 g/ft^3.

37. The process of claim 36 wherein the catalytic component is present in the amount of 50 to 150 g/ft^3.

38. The process of claim 28 wherein the alkali metal oxide is selected from the group consisting of oxides of potassium, sodium, lithium, cesium and mixtures thereof.

39. The process of claim 28 wherein component (a) of the NO_x sorbent comprises potassium and/or potassium oxide.

40. The process of claim 28 wherein the alkali metal oxide, if present, is present in an amount of about 0.05 to about 0.75 g/in^3.

41. The process of claim 40 wherein the alkali metal oxide, if present, is present in an amount of 0.1 to 0.5 g/in^3.

42. The process of claim 28 wherein the alkaline earth metal oxide is selected from the group consisting of oxides of barium, magnesium, calcium, strontium and mixtures thereof.

43. The process of claim 42 wherein the alkaline earth metal oxide comprises barium oxide.

44. The process of claim 28 wherein the alkaline earth metal oxide, if present, is present in an amount of about 0.1 to about 3 g/in^3.

45. The process of claim 44 wherein the alkaline earth metal oxide, if present, is present in an amount of 0.5 to 2.5 g/in^3.

46. The process of claim 28 wherein the manganese component is present in an amount of about 0.05 to about 0.5 g/in^3.

47. The process of claim 46 wherein the manganese component is present in the amount of 0.1 to 0.3 g/in^3.

48. The process of claim 28 wherein the manganese component comprises a manganese oxide is selected from the group consisting of MnO, Mn_3O_4, Mn_2O_3, MnO_2 and Mn_2O_7.

49. The process of claim 48 wherein the manganese component comprises a mixed oxide of manganese and a transition metal and/or a rare earth metal, said transition metal being selected from the group consisting of zirconium, titanium and tin, and said rare earth metal being selected from the group consisting of lanthanum, neodymium, niobium and praseodymium.

50. The process of claim 28 wherein the manganese component comprises a compound of an alkali metal and a manganese oxide, said alkali metal being selected from the group consisting of potassium, sodium, lithium and cesium.

51. The process of claim 28 wherein the manganese component comprises a compound of an alkaline earth metal and a manganese oxide, said alkaline earth metal being selected from the group consisting of barium, magnesium, calcium, strontium, and zinc.

52. The process of claim 28 wherein the carrier member is selected from the group consisting of stainless steel, titanium, Fecralloy, aluminum zirconate, aluminum titanate, aluminum phosphate, cordierite, mullite and corundum.

53. The process of claim 28 wherein the exhaust gas stream is treated with a three-way conversion catalyst disposed upstream of the trap

54. The process of claim 28 wherein the exhaust gas stream is treated with a three-way conversion catalyst disposed downstream of the trap.

55. A process for rejuvenating a spent catalyst, said spent catalyst comprising:

(A) a catalytic trap material, comprising:

(i) a refractory metal oxide support;

(ii) a catalytic component effective for promoting the reduction of NO_x under stoichiometric or rich conditions; and

(iii) a NO_x sorbent effective for adsorbing the NO_x under lean conditions and desorbing and reducing the NO_x to nitrogen under stoichiometric or rich conditions, comprising a metal oxide selected from the group consisting of alkali metal oxides, alkaline earth metal oxides and mixtures of one or more alkali metal oxides and alkaline earth metal oxides; and

(B) a refractory carrier member on which the catalytic trap material is disposed, said process comprising the steps of:

(i) post-impregnating the spent catalyst with an aqueous solution of a manganese component comprising: (a) a manganese salt or (b) a combination of salts of manganese and a transition metal and/or a rare earth metal or (c) a combination of salts of manganese and an alkali

metal or (d) a combination of salts of manganese and an alkaline earth metal or (e) mixtures of the foregoing salts; and

(ii) drying and calcining the post-impregnated catalyst resulting from step (1).

56. The process of claim 55 wherein the support is selected from the group consisting of alumina, titania, titania-alumina, zirconia, zirconia-alumina, baria-alumina and titania-zirconia.

57. The process of claim 56 wherein the support comprises gamma-alumina.

58. The process of claim 55 wherein the support is present in an amount of about 1.5 to about 5.0 g/in^3.

59. The process of claim 58 wherein the support is present in an amount of 2 to 4 g/in^3.

60. The process of claim 55 wherein the catalytic component comprises a precious metal component.

61. The process of claim 60 wherein the precious metal component is selected from the group consisting of platinum, palladium, rhodium components and mixtures thereof.

62. The process of claim 61 wherein the precious metal component comprises platinum which is present in an amount of at least about 20% by weight of the total amount of precious metal components.

63. The process of claim 55 wherein the catalytic component is present in an amount of about 20 to about 200 g/ft^3.

64. The process of claim 63 wherein the catalytic component is present in the amount of 50 to 150 g/ft^3.

65. The process of claim 55 wherein the alkali metal oxide is selected from the group consisting of oxides of potassium, sodium, lithium, cesium and mixtures thereof.

66. The process of claim 65 wherein the NO_x sorbent comprises potassium oxide.

67. The process of claim 55 wherein the alkali metal oxide, if present, is present in an amount of about 0.05 to about 0.75 g/in^3.

68. The process of claim 67 wherein the alkali metal oxide, if present, is present in an amount of 0.1 to 0.5 g/in^3.

69. The process of claim 55 wherein the alkaline earth metal oxide is selected from the group consisting of oxides of barium, magnesium, calcium, strontium and mixtures thereof.

70. The process of claim 69 wherein the alkaline earth metal oxide comprises barium oxide.

71. The process of claim 55 wherein the alkaline earth metal oxide, if present, is present in an amount of about 0.1 to about 3 g/in^3.

72. The process of claim 71 wherein the alkaline earth metal oxide, if present, is present in an amount of 0.5 to 2.5 g/in^3.

73. The process of claim 55 wherein the manganese component is present in the post-impregnated catalyst in an amount of about 0.05 to about 0.5 g/in^3.

74. The process of claim 73 wherein the manganese component is present in the post-impregnated catalyst in an amount of 0.1 to 0.3 g/in^3.

75. The process of claim 55 wherein the manganese salt is selected from the group consisting of manganese nitrate, manganese acetate, manganese sulfate and manganese hydroxide.

76. The process of claim 55 wherein the transition metal is selected from the group consisting of zirconium, titanium and tin, and the rare earth metal is selected from the group consisting of lanthanum, neodymium, niobium and praseodymium.

77. The process of claim 55 wherein the alkali metal present in the aqueous solution is selected from the group consisting of potassium, sodium, lithium and cesium.

78. The process of claim 55 wherein the alkaline earth metal present in the aqueous solution is selected from the group consisting of barium, magnesium, calcium, strontium, and zinc.

79. The process of claim 55 wherein the carrier member is selected from the group consisting of stainless steel, titanium, Fecralloy, aluminum zirconate, aluminum titanate, aluminum phosphate, cordierite, mullite and corundum.